

REPORT

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***GROUNDWATER SAMPLING RESULTS
APRIL 1998***

***FORMER CIBA SPECIALTY CHEMICALS FACILITY
CRANSTON, RHODE ISLAND***

Prepared for
Ciba Specialty Chemicals Corporation
Toms River Site
Route 37 West
Toms River, NJ 08754

August 1998

Woodward-Clyde 

Woodward-Clyde International-Americas
One Cranberry Hill
Lexington, MA 02173
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R E P O R T

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During the RCRA Facility Investigation that was conducted at the former Ciba Specialty Chemicals (Ciba) facility located in Cranston, Rhode Island (Site), the Public Health and Environmental Risk Evaluation (PHERE) determined that the shallow groundwater discharging from the Production Area posed a risk to the benthic invertebrates in the shallow sediments of the Pawtuxet River. To address this risk, a groundwater capture system was designed and constructed to minimize contaminated groundwater from discharging into the Pawtuxet River. The groundwater capture system has been operating since September 1995. In the Pawtuxet River Corrective Measure Study Report (PRCMS Report) that was submitted to United States Environmental Protection Agency (USEPA) in August 1996, Ciba proposed to:

1. Continue to operate the groundwater capture system and pretreatment system;
2. Conduct hydraulic monitoring; and
3. Perform groundwater sampling and analyses, as part of the performance and compliance monitoring program.

This report presents the results of the hydraulic monitoring that was performed in May 1998. It also summarizes the groundwater results of the compliance sampling that was performed in April 1998. The results of the hydraulic monitoring and compliance sampling are also compared to data generated during previous compliance sampling rounds.

2.1 PERFORMANCE MONITORING

In the PRCMS Report (Section 3.5.1, page 3-12), Ciba proposed to measure groundwater elevations in the Production Area quarterly during the first two years following startup of the groundwater capture systems and then semi-annually until the groundwater capture and pretreatment system were shutdown. Data generated during hydraulic monitoring are evaluated periodically to verify that the shallow groundwater in the Production Area is hydraulically controlled from discharging into the Pawtuxet River. An evaluation of the groundwater elevation data measured in May 1998 is presented in this report.

2.2 COMPLIANCE MONITORING

As part of the compliance monitoring program that was proposed in the PRCMS, groundwater is sampled semi-annually from selected overburden monitoring wells to evaluate changes in groundwater quality during the pumping of the groundwater capture system. Compliance sampling began in April 1997. Three sampling rounds have been completed: April 1997, October 1997, and April 1998. This report presents the results of the groundwater sampling that was performed in April 1998.

During the RCRA Facility Investigation, media protection standards (MPS) were developed for five of the VOCs that were detected in the Production Area groundwater. These compounds of concern and their respective MPS are summarized below (and discussed in detail in the PRCMS Report, Section 2.4.1 and Table 2-6).

Compound	MPS Concentration (ppb)
1,2-dichlorobenzene	94
chlorobenzene	1700
ortho-chlorotoluene	1500
toluene	1700 *
xylenes	76 **

* Rhode Island Groundwater Objective GB - Groundwater classified as GB has been designated by the Rhode Island Department of Environmental Management (RIDEM) as not suitable for public or private drinking water use.

** The MPS for xylenes was revised from 38 ppb to 76 ppb because the initial concentration (38 ppb) was mis-reported. This revision was approved by USEPA. A letter justifying the revision was prepared by PTRL and submitted to Ciba Specialty Chemicals on August, 21, 1997. That letter is included in Appendix A.

During the April 1998 compliance sampling round, 16 monitoring wells were sampled. Only 12 monitoring wells were proposed in the PRCMS to be sampled. At the request of USEPA, four additional wells (P-2D, MW-13S, MW-14S (VE-11), P-34S) were sampled in April 1998.

SECTION TWO

Scope of Work

During this compliance sampling round, groundwater was sampled and analyzed for a suite of volatile organic compounds. The compounds of concern (those compounds for which MPS have been developed) and the two additional chemicals of concern (ethylbenzene and tetrachloroethylene) were subsets of the suite of volatile organic compounds.

3.1 PERFORMANCE MONITORING

Groundwater elevations were measured in the Production Area during May 1998. These groundwater elevation data are presented in Table 1. A potentiometric surface map generated using groundwater elevations measured in May 1998 is presented in Figures 1. In general, groundwater elevation contours generated using May 1998 data were similar to the elevation contours that were generated under pumping conditions (April, July, and October 1997). During this evaluation, data generated under pumping conditions were compared to data generated under pre-pumping conditions. As a reference, groundwater elevation contours generated during pre-pumping conditions (September 1993) are shown in Figure 2. The May 1998 data indicate that groundwater elevations in the Production Area have stabilized following the startup of the pumping wells (PW-110 and PW-120) in September 1995. Furthermore, steady drawdown cones are observed in the Production Area at different times during the year.

3.2 COMPLIANCE MONITORING

Groundwater in the Production Area was sampled during the period April 27 through April 28, 1998. Sixteen monitoring wells were sampled to evaluate changes in groundwater quality during the operation of the groundwater capture system. All monitoring wells were sampled for VOCs. Monitoring well locations are shown in Figure 3. The analytical results generated during the compliance sampling performed in April 1998 are summarized in Table 2. The analytical results for all compliance sampling rounds (April 1998, October 1997, April 1997) are summarized in Table 3. In these tables, only the compounds of concern and the additional chemicals of concern are presented. All VOCs detected in the groundwater sampled during April 1998 are presented in the complete laboratory reports that are included in Appendix B.

A summary of the April 1998 analytical results for each of the compounds of concern is presented below.

- Chlorobenzene was detected in 12 of the 16 wells sampled. The detected concentrations ranged from 2 ppb to 2800 ppb. Groundwater sampled from one monitoring well (MW-1S) exceeded the MPS of 1700 ppb developed for this compound.
- 1,2-dichlorobenzene was detected in 8 of 16 monitoring wells sampled. The detected concentrations ranged from 2 ppb to 180 ppb. Groundwater sampled from one monitoring well (MW-14S (VE-11)) exceeded the MPS of 94 ppb developed for this compound.
- Toluene was detected in 7 of the 16 wells sampled. The detected concentrations ranged from 1 ppb to 93,000 ppb. Groundwater sampled from two of the monitoring wells (MW-4S and MW-14S (VE-11)) exceeded the MPS of 1700 ppb developed for this compound.
- Xylenes (total) were detected in 8 of the 16 monitoring wells sampled. Xylenes were detected at concentrations ranging from 2 ppb to 14,000 ppb. Groundwater sampled

from two of the monitoring wells (MW-4S and MW-14S (VE-11)) exceeded the MPS of 76 ppb developed for this compound.

- Ortho-chlorotoluene was detected in 7 of the 16 wells sampled. Detected concentrations ranged from 2 ppb to 60,000 ppb. Groundwater sampled from one monitoring well (MW-14S (VE-11)) exceeded the MPS of 1500 ppb developed for this compound.

During the April 1998 compliance sampling, groundwater was also analyzed for two additional chemicals of concern (ethylbenzene and tetrachloroethylene). The results of these analysis are summarized below.

- Ethylbenzene was detected in 8 of 16 wells sampled. The detected concentrations ranged from 2 to 2600 ppb. Although no MPS was developed for ethylbenzene, groundwater sampled from one monitoring well (MW-14S (VE-11)) did exceed the RIDEM groundwater objective developed for this compound (1600 ppb) in groundwater classified GB.
- Tetrachloroethylene was detected in 3 of 16 wells sampled. The detected concentrations ranged from 2 to 180 ppb. Although no MPS was developed for tetrachloroethylene, groundwater sampled from one monitoring well (MW-14S (VE-11)) did exceed the RIDEM groundwater objective developed for this compound (150 ppb) in groundwater classified GB.

4.1 PERFORMANCE MONITORING

Groundwater elevations in the Production Area and the in-river monitoring wells are now measured semi-annually. Groundwater elevations measured under pre-pumping conditions were compared to elevations measured during pumping. Data generated during May 1998, indicate that groundwater elevations in the Production Area have stabilized following the startup of the pumping wells (PW-110 and PW-120) in September 1995. Steady drawdown cones continue to be observed in the Production Area (see Figures 1 and 2).

4.2 COMPLIANCE SAMPLING

The results of the compliance sampling are discussed here. During this evaluation, the analytical results generated during April 1998 were compared to the April 1997 results (Table 3). (For completeness of study, the analytical results generated during October 1997 are also summarized in Table 3). The analytical results are presented by location. The results of the shallow monitoring wells located in the Pawtuxet River are discussed first. The sampling results of the monitoring wells and piezometers located along the bulkhead (in the Production Area) are presented next. Finally, the analytical results of the upgradient monitoring wells and piezometers (located in the western part of the Production Area) are discussed last.

4.2.1 Monitoring Wells in the Pawtuxet River

When the April 1998 compliance sampling results were compared to the April 1997 compliance sampling results, generally, the types of contaminants present and the concentrations detected were similar (Table 3). One exception was noted. In April 1998, chlorobenzene was detected in groundwater sampled from SW-110 at a concentration of 1100 ppb. Previously, it was detected at concentration of 110 ppb in April 1997. The concentrations of VOCs (compounds of concern and additional chemicals of concern) detected in the monitoring wells located in the Pawtuxet River continue to be below the MPS. These data indicate that the groundwater capture system continues to minimize contaminated groundwater from entering the Pawtuxet River. Plots of VOC data from monitoring wells SW-110, SW-120, and SW-130 are presented in Figure 4 through 6.

4.2.2 Monitoring Wells Located Near Bulkhead

Changes in groundwater quality were observed in some of the monitoring wells and piezometers located along the bulkhead (within the Production Area). Groundwater quality from eight monitoring wells and piezometers was evaluated during the compliance sampling that was performed in April 1998. For six monitoring wells and piezometers, the April 1998 groundwater results could be compared to the groundwater data generated during the April 1997 compliance sampling round. In five of the monitoring wells and piezometers, the concentration of chlorobenzene increased from April 1997 to April 1998. In one monitoring well (MW-1S), chlorobenzene was detected at a concentration of 2800 ppb. The MPS established for this compound of concern is 1700 ppb. In general, the concentration of the other compounds of concern detected in the wells located along the bulkhead remained about the same. All

compounds of concern detected during the April 1998 compliance sampling round (with the exception of chlorobenzene detected in MW-1S) were below the MPS.

4.2.3 Upgradient Monitoring Wells (Located in the Western Part of the Production Area)

Changes in groundwater quality were observed in some of the upgradient monitoring wells that were sampled in April 1998. Groundwater was sampled from selected monitoring wells (MW-04S, MW-12S, MW-21S and MW-14S (VE-11)) located in the western part of the Production Area. These results were compared to the groundwater data that was generated during the April 1997 compliance sampling round (Table 3). One monitoring well (MW-14S (VE-11)) sampled in April 1998, was not sampled during the compliance sampling performed in April 1997. MW-14S (VE-11) was however, sampled in October 1997. These results are presented below.

When the April 1998 analytical results were compared to the April 1997 results, the concentrations of VOCs detected generally increased. In MW-14S (VE-11), the VOC concentrations increased significantly when the results were compared to the data generated during October 1997. During April 1998, four VOCs (chlorobenzene, 1,2-dichlorobenzene, toluene, and xylenes) were detected in MW-14S (VE-11) at concentrations which exceeded the MPS. Only minor increases in VOC concentrations were observed in monitoring wells MW-4S and MW-12S. Three compounds of concern were detected in monitoring wells MW-4S and MW-12S which exceeded MPS. In MW-21S, the VOCs detected in April 1998 were about the same as detected in April 1997. The VOC concentrations detected in MW-21S were significantly less than the VOC concentrations detected in October 1997. None of the compounds of concern detected in MW-21S exceeded MPS.

5.1 PERFORMANCE MONITORING

Groundwater performance monitoring was performed in May 1998 in accordance with the program described in the PRCMS Report. Groundwater elevations in the Production Area continue to be measured since the startup of the groundwater capture system (September 1995). Data generated during April 1998 continue to indicate that the groundwater elevations in the Production Area have stabilized following the startup of pumping wells PW-110 and PW-120. Steady drawdown cones continue to be observed in the Production Area indicating that the shallow groundwater in the Production Area is hydraulically controlled from discharging into the Pawtuxet River. To confirm that the groundwater capture continues to work effectively, groundwater elevations will continue to be measured and evaluated semi-annually.

5.2 COMPLIANCE MONITORING

Compliance monitoring was performed in April 1998. Sixteen monitoring wells were sampled to evaluate changes in groundwater quality. The monitoring wells were sampled for both compounds of concern and additional chemicals of concern. Data generated in April 1998 were compared to results generated in April 1997. The main results are summarized below.

- *Monitoring Wells in Pawtuxet River* - In monitoring well SW-110, chlorobenzene was detected at 1100 ppb. This was the highest concentration detected in the in-river monitoring wells since compliance monitoring began in April 1997. Other contaminants were detected in this well but at concentrations well below their respective MPS. In the other in-river wells, chlorobenzene and ortho-chlorobenzene were also detected but at concentrations well below the MPS.
- *Monitoring Wells Located Along Bulkhead* - The concentration of chlorobenzene detected in monitoring wells/piezometers (MW-1S, P-36S, and P-37S) located in the central portion of the bulkhead increased since the last sampling round. In one monitoring well, MW-1S, chlorobenzene was detected at a concentration of 2800 ppb (which exceeded the MPS of 1700 ppb). In the other monitoring wells and piezometers located along the bulkhead (MW-2S, P-2D, and P-38S), the concentrations either remained the same, or showed minor increases or decreases in contaminant concentrations. In piezometer P-35S, the concentration of 1,2-dichlorobenzene (42 ppb) decreased below the MPS of 94 ppb.
- *Upgradient Monitoring Wells (Located in the Western Part of the Production Area)* - In the SWMU-11 Area, the concentrations of selected contaminants increased significantly in selected monitoring wells and piezometers (MW-14S (VE-11), MW-4S). In MW-14S (VE-11), the concentrations of toluene and ortho-chlorotoluene increased by more than an order of magnitude. Toluene and ortho-chlorotoluene were detected in MW-14S (VE-11) at concentrations of 93,000 ppb and 60,000 ppb, respectively. In total, four of the contaminants detected in MW-14S (VE-11) exceeded the MPS. In MW-4S, selected contaminants increased and decreased in concentration. In MW-4S, the concentrations of toluene and xylenes exceeded the MPS. In monitoring well MW-21S, located outside the

fence line along Mill Street, all of contaminants decreased significantly during the April 1998 sampling round. During this recent sampling round, only one contaminant (ortho-chlorotoluene) was detected and it was detected at a concentration of 54 ppb well below the MPS of 1500).

5.3 RECOMMENDATIONS

No changes are proposed in the performance and compliance monitoring programs that was proposed in the PRCMS. The groundwater captured will continue to operate to hydraulically control the shallow groundwater in the Production Area from discharging into the Pawtuxet River. Groundwater in the Production Area will continue to be sampled semi-annually. The next sampling is planned for October 1998. The results will be compared to the data generated during previous rounds to determine if some of the results observed in previous sampling rounds are anomalous or are indicative of longer term trends that might be expected.

Tables

Well No.	Easting	Northing	9/30/93	1/25/96	9/25/96	1/29/97	4/10/97	2/27/97	7/29/97	10/16/97	1/12/98	5/8/98	
MW-10S	523867.4	249130.7	11.34	13.12	11.17	12.64	12.79	11.50	10.39	10.22	11.67	12.49	
MW-12S	523928.7	249087.9	10.54	11.59	10.90	12.02	12.19	11.19	9.76	9.62	11.14	12.13	
MW-13S	524005.7	248966.5	9.83	9.09	8.77	10.14			8.92	7.72	7.62	9.09	10.12
MW-14S	523777.7	248988.2	11.16	12.64	11.19								
MW-1S	523990.9	248849.4	9.39	9.43	8.09	9.81	5.89	7.63	6.25	6.04	8.36	8.17	
MW-20S	523746.4	249135.3	11.53	12.66	11.51	12.64	13.17	11.82	10.37	10.22	11.79	12.79	
MW-22S	523774.3	248691.8	9.63	11.72	10.05	11.47		9.93	8.66	8.46	10.67	11.67	
MW-23S	524116.1	249000.3	9.41	10.31	9.26	10.51		9.56	8.33	8.19	9.68	10.43	
MW-24S	523973.0	249119.8	10.89	12.04	10.92	12.09		11.34		11.24	11.29	21.21	
MW-2S	523904.8	248697.9	9.21	10.68	8.40	10.13	10.07	7.76	6.60	6.62	9.30	10.36	
MW-34S	523842.9	248854.8	10.40	12.43	10.85	11.95	11.94	10.63	9.05	8.90	11.75	12.37	
MW-3S	524119.1	248937.1	7.96	9.61	8.61	10.13	9.99	8.76	7.81	7.73	8.88	9.79	
MW-4S	523860.3	249005.4	10.72	11.69	10.67	11.71	12.84	10.83	9.34	9.17	10.95	11.89	
P-1S	523997.6	248838.4	9.17	8.41	7.09	8.73		10.27	5.88	5.85	7.43	8.41	
P-2S	523887.3	248686.0	8.38	8.95	8.04	9.14		4.40	5.55	6.74	8.62	9.25	
P-34S	523896.4	248794.8	10.12	12.20	10.30	12.00		10.05	8.55	8.41	11.24	11.56	
P-35S	523937.4	248746.3	8.51	9.42	7.79	9.52	9.43	7.71	6.82	6.66	8.32	9.37	
P-36S	523974.6	248800.7	8.62	7.53	7.81	9.59	9.47	7.75	6.79	6.66	8.22	9.39	
P-37S	524032.3	248869.4	8.96	5.49	4.59	6.48	6.21	4.53	3.64	3.64	4.97	6.69	
P-38S	524085.8	248913.8	8.74	8.89	7.63	9.28	9.16	7.72	6.74	6.69	7.95	8.96	
P-3S	524128.1	248942.4	7.09	8.80	7.57	9.40		7.65	8.49	6.86	7.82	8.77	
P-4S	523768.1	249042.1	11.07	12.29	11.23	12.37		11.55	10.10	10.02	11.53	12.45	
P-5S	523912.4	249030.6	10.68	11.06	10.04	11.28		10.31	8.83	8.88	10.28	11.31	
P-6S	524015.4	249111.6	10.39	11.61	10.67	11.59		11.12	9.02	9.40	11.22	11.81	

Note

Shaded areas indicate wells that were not measured.

These missing data points do not alter the contoured water table.

TABLE 1 - Groundwater Elevation Data
Former Ciba Specialty Chemical Facility
Cranston, Rhode Island

LOCATION SAMPLE DATE	MW-1S 4/27/98	MW-2S 4/28/98	P-2D 4/27/98	MW-4S 4/28/98	MW-12S 4/28/98	MW-13S 4/28/98	MW-21S 4/28/98	SW-110 4/27/98	Proposed MPS
ANALYTE	METHOD	Result Q (ug/L)							
VOLATILE ORGANICS	8240								
Chlorobenzene		2800	500	2	220	U	U	U	1100
1,2-Dichlorobenzene		U	22	4	40	U	U	U	21
Toluene		1	88	U	<i>2700</i>	U	U	U	170
Xylenes (Total)		2	28	U	<i>130</i>	65	U	U	6
ortho-Chlorotoluene		U	U	U	1200	U	U	54	2
Ethylbenzene		4	11	U	38	26	U	U	2
Tetrachloroethylene		U	13	U	2	U	U	U	NA

LOCATION SAMPLE DATE	SW-120 4/27/98	SW-130 4/27/98	P-34S 4/27/98	P-35S 4/27/98	P-36S 4/27/98	P-37S 4/27/98	P-38S 4/28/98	MW-14S (VE-11) 4/28/98	Proposed MPS
ANALYTE	METHOD	Result Q (ug/L)							
VOLATILE ORGANICS	8240								
Chlorobenzene		54	27	420	360	260	420	U	130
1,2-Dichlorobenzene		U	U	2	42	U	2	U	180
Toluene		U	U	110	2	U	U	U	93000
Xylenes (Total)		U	U	8	10	U	U	U	14000
ortho-Chlorotoluene		U	14	130	U	U	8	U	60000
Ethylbenzene		U	U	3	5	U	U	U	2600
Tetrachloroethylene		U	U	U	U	U	U	U	180

Notes: U - Analyte not detected.

NA - Not applicable, MPS were not developed for these compounds.

Bold and Italic - Concentrations shown in bold italics exceed MPS.

TABLE 2 - Summary of Groundwater Analytical Results
Generated During Compliance Sampling

April 1998

Former Ciba Specialty Chemicals Facility
Cranston, Rhode Island

ANALYTE	METHOD	LOCATION	MW-1S	MW-1S	MW-1S	MW-2S	MW-2S	P-2D	P-2D	MW-4S	MW-4S	MW-12S	MW-12S	MW-12S	Proposed	
		SAMPLE DATE	4/8/97	10/7/97	4/27/98	4/8/97	10/7/97	4/28/98	10/7/97	4/27/98	4/9/97	10/8/97	4/28/98	4/10/97	10/8/97	Result MPS
VOLATILE ORGANICS 8240																
Chlorobenzene		93	640	2800	64	440	500	17	2	44	41	220	U	U	U	1700
1,2-Dichlorobenzene		1	1	U	20	90	22	22	4	43	72	40	U	U	U	94
Toluene		9	23	1	46	97	88	1	U	88	370	2700	U	U	U	1700
Xylenes (Total)		7	2	2	18	31	28	U	U	100	480	130	U	12	65	76
ortho-Chlorotoluene		U	30	U	U	100	U	U	U	160	660	1200	U	U	U	1500
Ethylbenzene		12	4	4	6	11	11	U	U	63	75	38	U	U	U	26
Tetrachloroethylene		U	U	U	18	U	13	1	U	2	1	2	U	U	U	NA

ANALYTE	METHOD	LOCATION	MW-13S	MW-13S	MW-21S	MW-21S	MW-21S	SW-110	SW-110	SW-110	SW-120	SW-120	SW-120	SW-120	Proposed	
		SAMPLE DATE	10/8/97	4/28/98	4/10/97	Result Q (ug/L)	Result Q (ug/L)	Result Q (ug/L)	4/28/98	4/10/97	Result Q (ug/L)	10/8/97	4/27/98	4/8/97	10/7/97	4/27/98
VOLATILE ORGANICS 8240																
Chlorobenzene		3	U	U	49	U	110	U	1100	43	39	54	U	U	U	1700
1,2-Dichlorobenzene		U	U	U	30	U	23	U	21	U	1	U	U	U	U	94
Toluene		U	U	1	20000	U	62	U	170	U	31	U	U	U	U	1700
Xylenes (Total)		1	U	6	1600	U	8	U	6	U	2	U	U	U	U	76
ortho-Chlorotoluene		U	U	120	24000	54	1	U	2	U	39	U	U	U	U	1500
Ethylbenzene		U	U	U	310	U	3	U	2	U	U	U	U	U	U	NA
Tetrachloroethylene		U	U	U	16	U	U	U	U	U	U	U	U	U	U	NA

ANALYTE	METHOD	LOCATION	SW-130	SW-130	SW-130	P-34S	P-35S	P-35S	P-35S	P-36S	P-36S	P-36S	P-36S	P-36S	Proposed	
		SAMPLE DATE	4/9/97	10/7/97	4/27/98	Result Q (ug/L)	Result Q (ug/L)	Result Q (ug/L)	4/27/98	Result Q (ug/L)	10/7/97	4/27/98	4/8/97	10/7/97	4/27/98	MPS
VOLATILE ORGANICS 8240																
Chlorobenzene		1	U	27	420	74	710	360	72	35	260	U	U	U	U	1700
1,2-Dichlorobenzene		U	U	U	2	22	240	42	U	U	U	U	U	U	U	94
Toluene		U	U	U	110	4	10	2	U	2	U	U	U	U	U	1700
Xylenes (Total)		U	U	U	8	12	12	10	2	U	U	U	U	U	U	76
ortho-Chlorotoluene		12	2	14	130	U	2	U	U	9	U	U	U	U	U	1500
Ethylbenzene		U	U	U	3	4	9	5	1	U	U	U	U	U	U	NA
Tetrachloroethylene		U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA

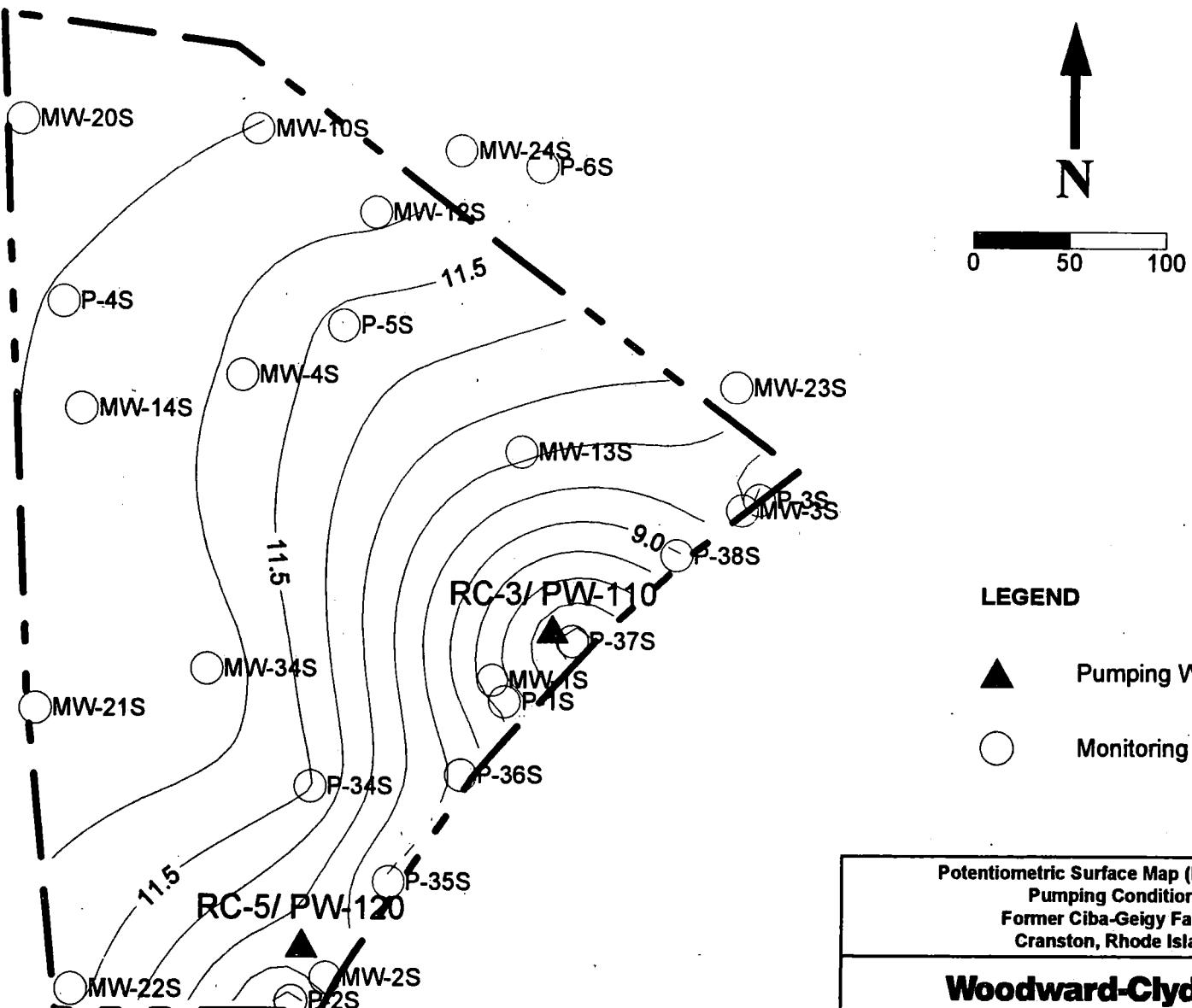
ANALYTE	METHOD	LOCATION	P-37S	P-37S	P-37S	P-38S	P-38S	P-38S	MW-14S (VE-11)	MW-14S (VE-11)	MW-14S (VE-11)	MW-14S (VE-11)	MW-14S (VE-11)	MW-14S (VE-11)	Proposed
		SAMPLE DATE	4/9/97	10/8/97	Result Q (ug/L)	Result Q (ug/L)	Result Q (ug/L)	4/9/97	10/8/97	Result Q (ug/L)	4/28/98	10/8/97	4/28/98	10/8/97	4/28/98
VOLATILE ORGANICS 8240															
Chlorobenzene		54	50	420	U	U	U	U	380	130	1700	U	U	U	U
1,2-Dichlorobenzene		U	2	2	U	U	U	U	230	180	94	U	U	U	U
Toluene		U	U	U	U	U	U	U	7500	93000	1700	U	U	U	U
Xylenes (Total)		1	U	U	U	U	U	U	7800	14000	76	U	U	U	U
ortho-Chlorotoluene		16	13	8	U	U	U	U	7100	60000	1500	U	U	U	U
Ethylbenzene		U	U	U	U	U	U	U	220	2600	NA	U	U	U	U
Tetrachloroethylene		U	U	U	U	U	U	U	150	180	NA	U	U	U	U

Notes: U - Analyte not detected.

NA - Not applicable, MPS were not developed for these compounds.

Bold and Italic - Concentrations shown in bold italics exceed MPS.

Figures



LEGEND

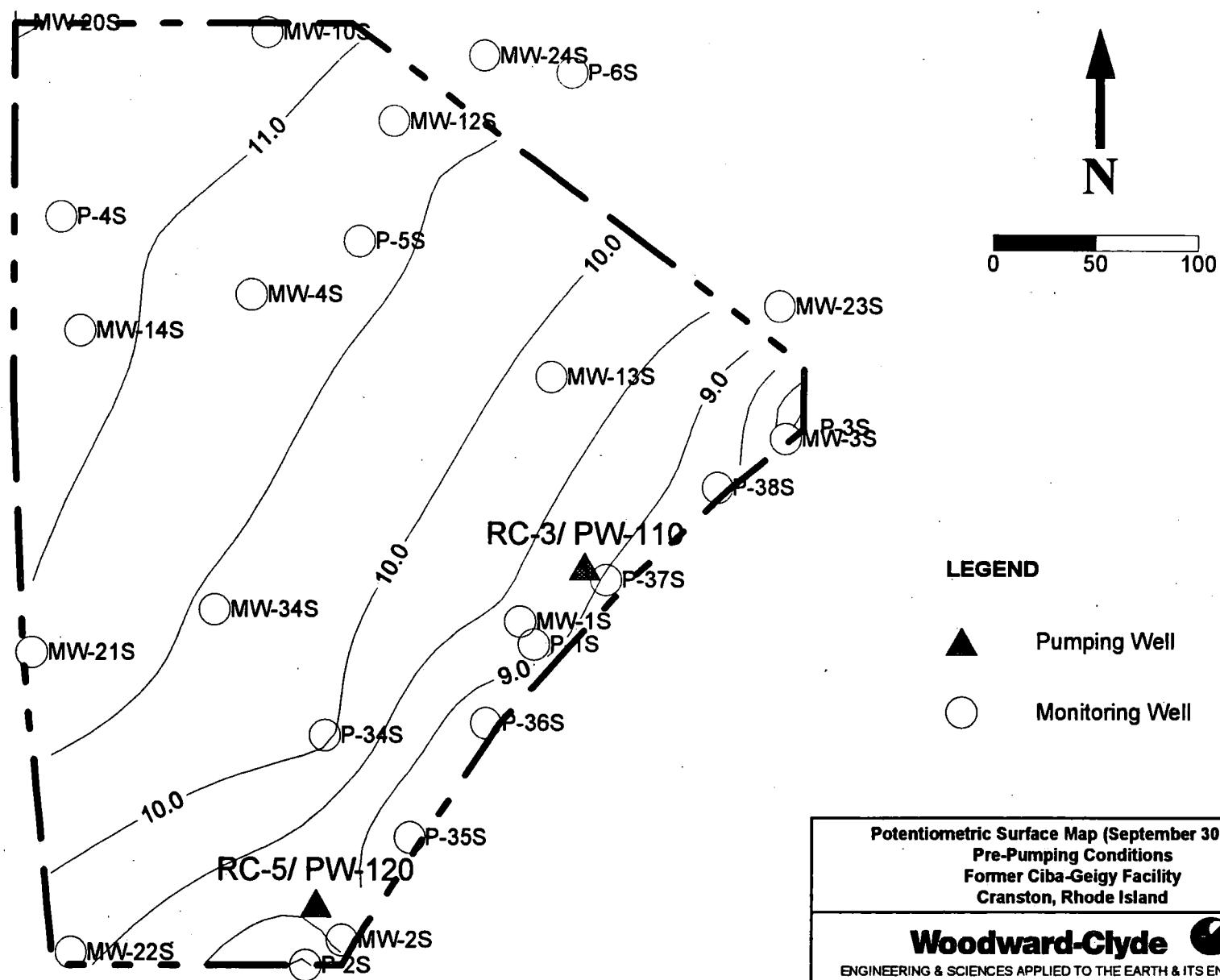
- ▲ Pumping Well
- Monitoring Well

Potentiometric Surface Map (May 8, 1998)
 Pumping Conditions
 Former Ciba-Geigy Facility
 Cranston, Rhode Island

Woodward-Clyde

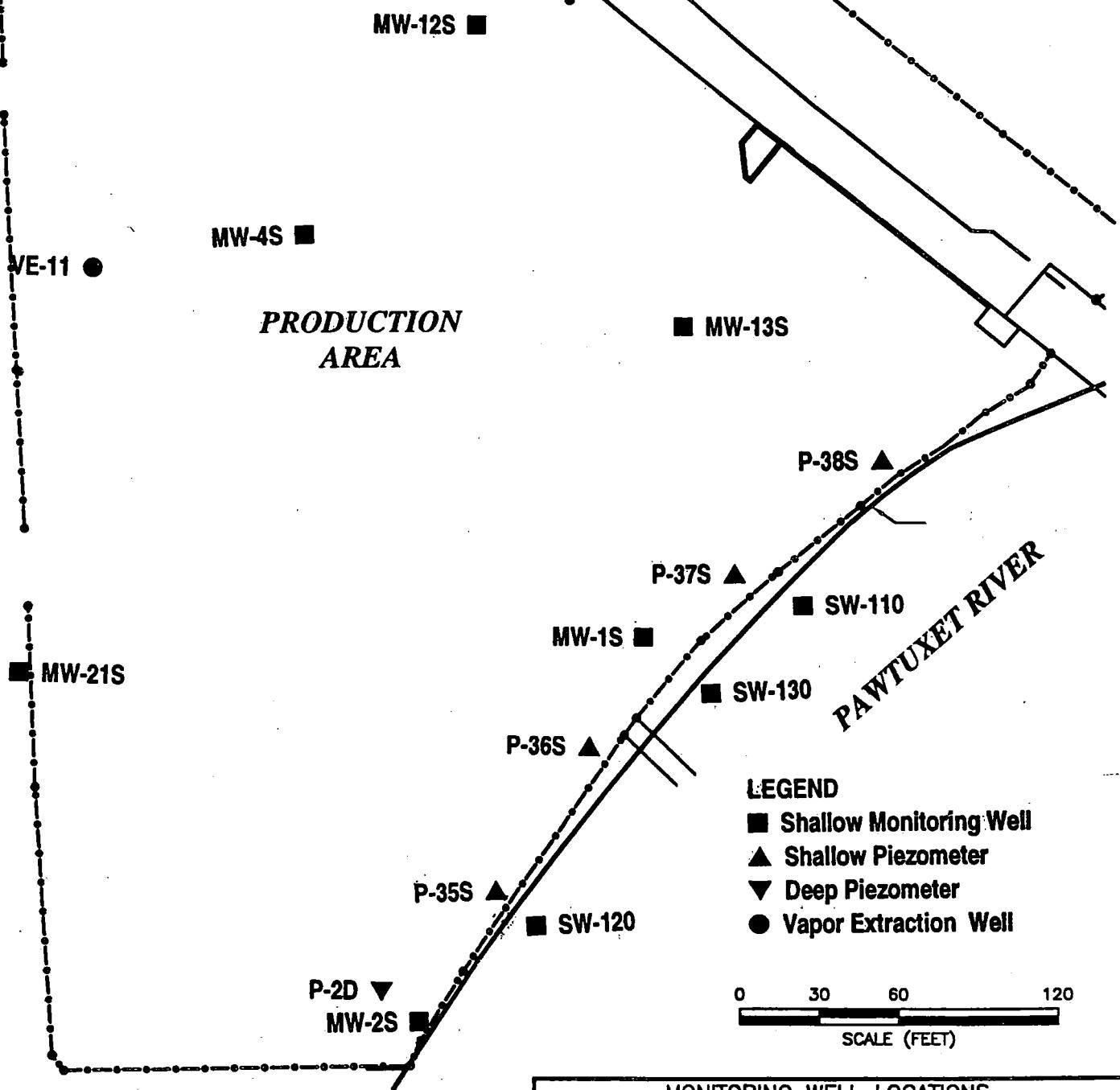
ENGINEERING & SCIENCES APPLIED TO THE EARTH & ITS ENVIRONMENT
 WAYNE, NEW JERSEY

DR. BY:	RZJ	SCALE:	AS SHOWN	PROJ. NO.:	87X4660D
CK'D. BY:	RZJ	DATE:	AUG 8, 1998	FIG. NO.:	1



Potentiometric Surface Map (September 30, 1993) Pre-Pumping Conditions Former Ciba-Geigy Facility Cranston, Rhode Island		
Woodward-Clyde		
ENGINEERING & SCIENCES APPLIED TO THE EARTH & ITS ENVIRONMENT WAYNE, NEW JERSEY		
DR. BY: RZJ	SCALE: AS SHOWN	PROJ. NO.: 87X4660D
CK'D. BY: RZJ	DATE: AUG 8, 1998	FIG. NO.: 2

**OFF-SITE
AREA**

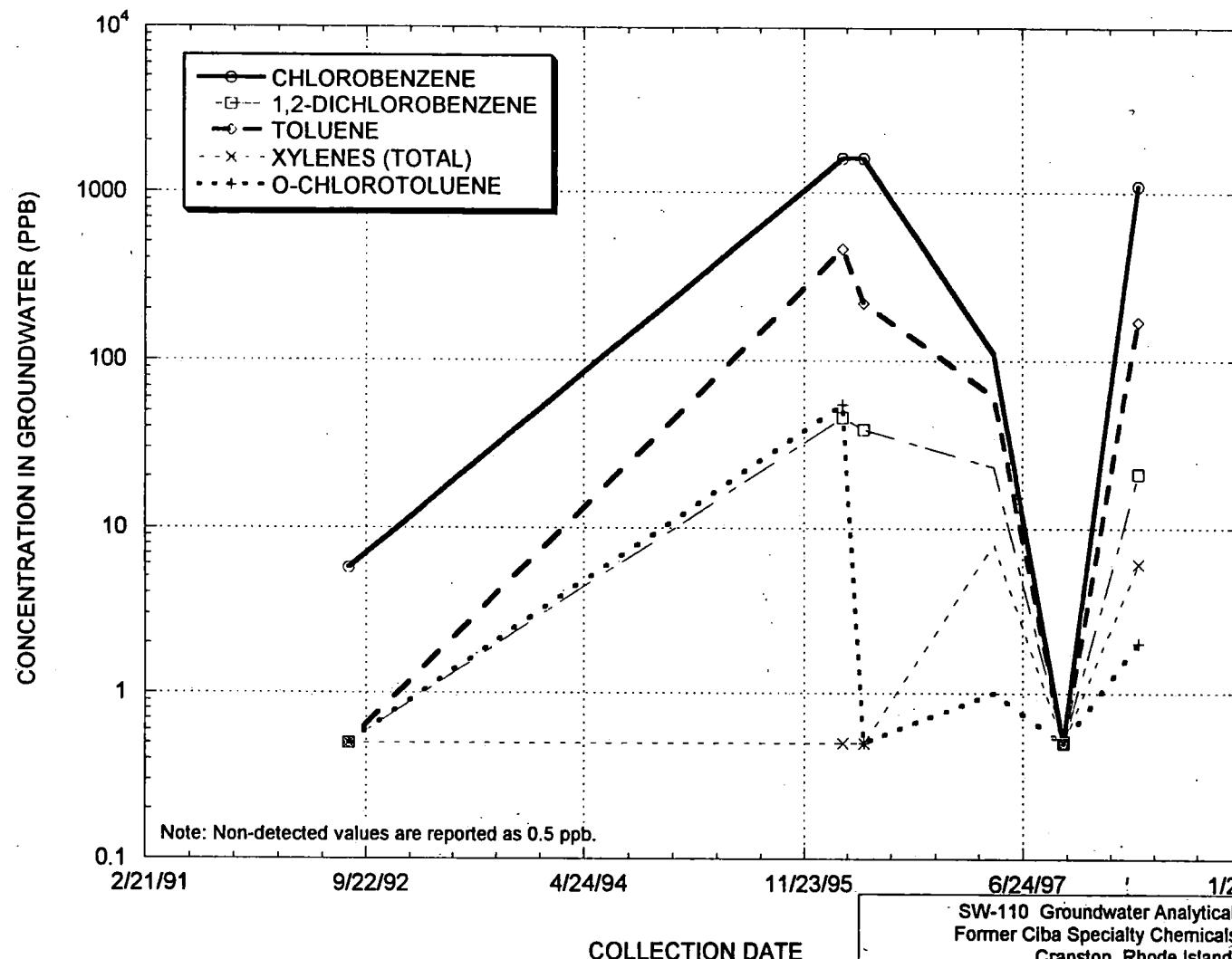


MONITORING WELL LOCATIONS
FORMER CIBA SPECIALITY CHEMICAL FACILITY
CRANSTON, RHODE ISLAND

WOODWARD-CLYDE CONSULTANTS

ENGINEERING & SCIENCES APPLIED TO THE EARTH & ITS ENVIRONMENT
WAYNE, NEW JERSEY

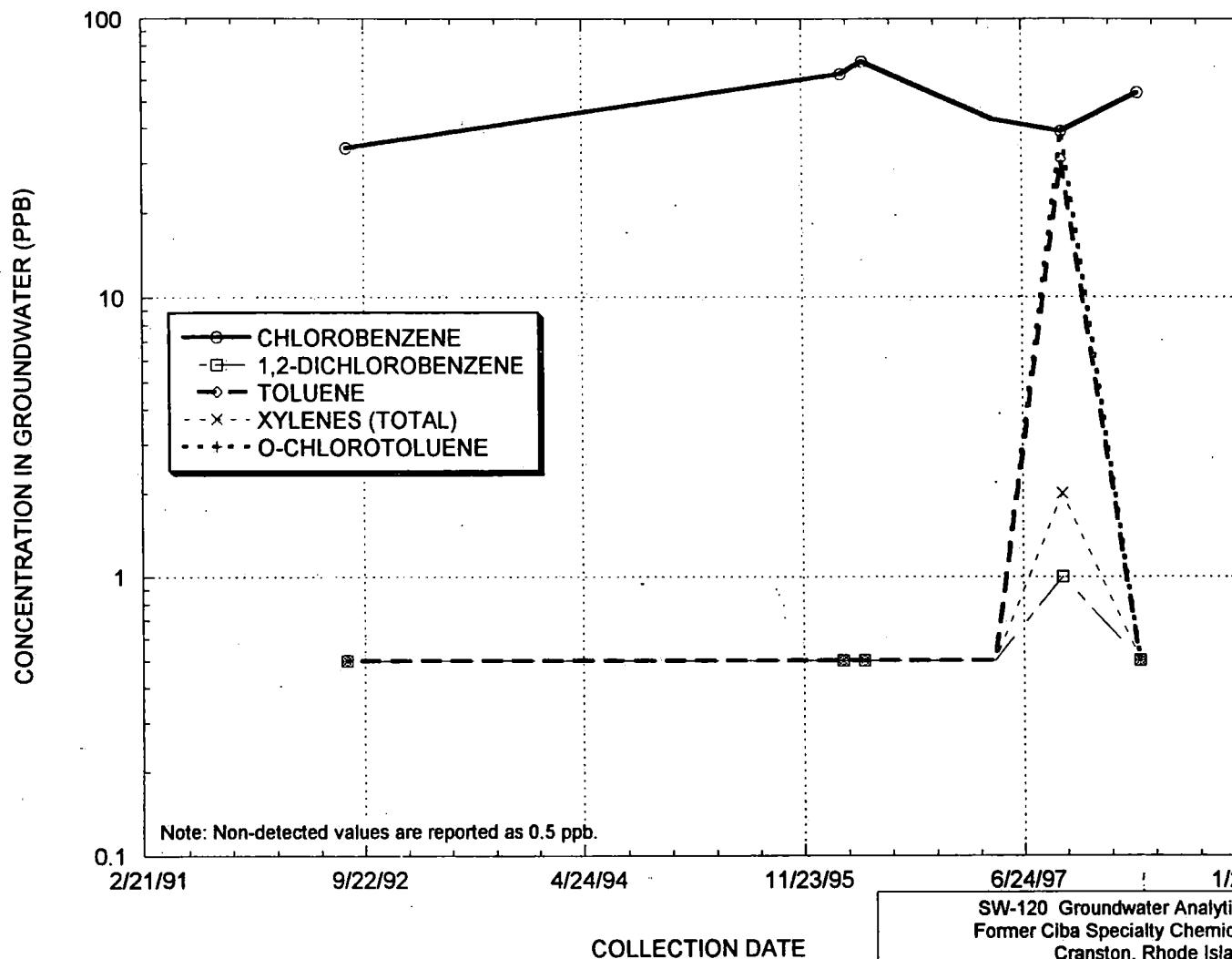
DR BY	JL	SCALE	1" - 60'	DWG. NO.	74860008	PROJ.	87X4680D
CK'D BY	RJ			DATE	AUG 7, 1987	FIG. NO. 3	



SW-110 Groundwater Analytical Results
Former Cliba Specialty Chemicals Facility
Cranston, Rhode Island

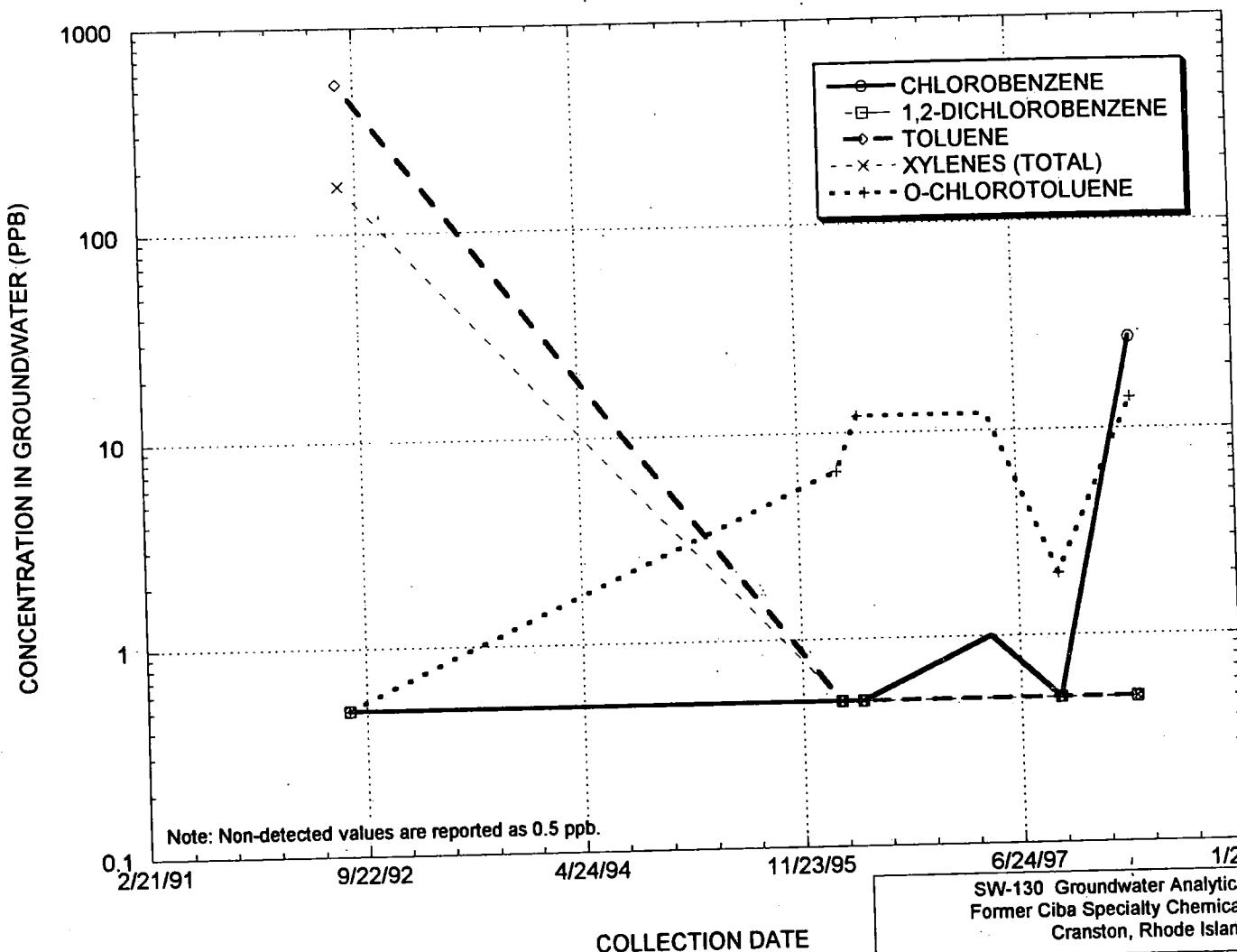
Woodward-Clyde 
Engineering & sciences applied to the earth & its environment
Wayne, New Jersey

DR. BY: RZJ	SCALE: NA	PROJ. NO.: 87x4660d
CKD BY: MH	DATE: AUG 6, 1998	FIG. NO.: 4



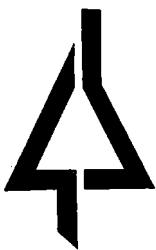
COLLECTION DATE

SW-120 Groundwater Analytical Results Former Ciba Specialty Chemicals Facility Cranston, Rhode Island		
Woodward-Clyde  Engineering & sciences applied to the earth & its environment Wayne, New Jersey		
DR. BY: RZJ	SCALE: NA	PROJ. NO.: 87x4660d
CKD BY: MH	DATE: AUG 6, 1998	FIG. NO.: 5



SW-130 Groundwater Analytical Results Former Ciba Specialty Chemicals Facility Cranston, Rhode Island		
Woodward-Clyde  Engineering & sciences applied to the earth & its environment Wayne, New Jersey		
DR. BY: RZJ	SCALE: NA	PROJ. NO.: 87x4660d
CKD BY: MH	DATE: AUG 6, 1998	FIG. NO.: 6

Appendix A



R.I. Analytical

Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
Attn: Mr. Barry Cohen
Env.Bldg.#743 Rt. 37 West
Toms River, NJ 08754

Date Received: 4/28/98
Date Reported: 5/07/98
P.O. #: T161 T1124
Work Order #: 9804-03198

DESCRIPTION: CIBA-MILL ST., CRANSTON, RI GROUNDWATER SAMPLING

Subject sample(s) has/have been analyzed by our laboratory with the attached results.

Reference: All parameters were analyzed by U.S. EPA approved methodologies. The specific methodologies are listed in the methods column of the Certificate Of Analysis



If you have any questions regarding this work, or if we maybe of further assistance, please contact us.

Approved by:

James E. Mich
Vice President

enc: Chain of Custody


Michael J. Hobin
Quality Control Coordinator

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 001

SAMPLE DESCRIPTION: MW-02S GRAB 04/27/98 @0955

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 11:36	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 11:36	MED
vinyl chloride	68	1	ug/l	SW-846 8240	5/01/98 11:36	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 11:36	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 11:36	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,1-dichloroethylene	1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
trans-1,2-dichloroethylene	19	1	ug/l	SW-846 8240	5/01/98 11:36	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,2-dichloropropene	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
trichloroethylene	15	1	ug/l	SW-846 8240	5/01/98 11:36	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
Tetrachloroethylene	13	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
Chlorobenzene	500	1	ug/l	SW-846 8240	5/01/98 11:36	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 11:36	MED
benzene	15	1	ug/l	SW-846 8240	5/01/98 11:36	MED
toluene	88	1	ug/l	SW-846 8240	5/01/98 11:36	MED
ethylbenzene	11	1	ug/l	SW-846 8240	5/01/98 11:36	MED
xylenes	28	1	ug/l	SW-846 8240	5/04/98 22:56	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 11:36	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/01/98 11:36	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 11:36	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 11:36	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 11:36	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 11:36	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 001

MW-02S GRAB 04/27/98 @0955

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	22	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 11:36	MED
Surrogates				SW-846 8240	5/01/98 11:36	MED
Dibromofluoromethane	88		86-118%	SW-846 8240	5/01/98 11:36	MED
4-Bromofluorobenzene	109		86-115%	SW-846 8240	5/01/98 11:36	MED
Toluene-D8	112		88-110%	SW-846 8240	5/01/98 11:36	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 002

SAMPLE DESCRIPTION: P-02D GRAB 04/27/98 @1045

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 13:59	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 13:59	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 13:59	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 13:59	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
Chlorobenzene	2	1	ug/l	SW-846 8240	5/01/98 13:59	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 13:59	MED
benzene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
toluene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
xlenes	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 13:59	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/01/98 13:59	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 13:59	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 13:59	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 13:59	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 13:59	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 002

P-02D GRAB 04/27/98 @1045

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	4	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 13:59	MED
Surrogates				SW-846 8240	5/01/98 13:59	MED
Dibromofluoromethane	89		86-118%	SW-846 8240	5/01/98 13:59	MED
4-Bromofluorobenzene	108		86-115%	SW-846 8240	5/01/98 13:59	MED
Toluene-D8	112		88-110%	SW-846 8240	5/01/98 13:59	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 003

SAMPLE DESCRIPTION: P-35S GRAB 04/27/98 @1110

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 14:50	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 14:50	MED
vinyl chloride	6	1	ug/l	SW-846 8240	5/01/98 14:50	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 14:50	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 14:50	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
trichloroethylene	2	1	ug/l	SW-846 8240	5/01/98 14:50	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
Chlorobenzene	360	1	ug/l	SW-846 8240	5/01/98 14:50	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 14:50	MED
benzene	5	1	ug/l	SW-846 8240	5/01/98 14:50	MED
toluene	2	1	ug/l	SW-846 8240	5/01/98 14:50	MED
ethylbenzene	5	1	ug/l	SW-846 8240	5/01/98 14:50	MED
xylenes	10	1	ug/l	SW-846 8240	5/01/98 14:50	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 14:50	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/01/98 14:50	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 14:50	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 14:50	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 14:50	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 14:50	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 003

P-35S GRAB 04/27/98 @1110

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	42	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 14:50	MED
Surrogates				SW-846 8240	5/01/98 14:50	MED
Dibromofluoromethane	88		86-118%	SW-846 8240	5/01/98 14:50	MED
4-Bromofluorobenzene	98		86-115%	SW-846 8240	5/01/98 14:50	MED
Toluene-D8	108		88-110%	SW-846 8240	5/01/98 14:50	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 004

SAMPLE DESCRIPTION: SW-120 GRAB 04/27/98 @1145

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 17:15	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 17:15	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 17:15	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 17:15	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
Chlorobenzene	54	1	ug/l	SW-846 8240	5/01/98 17:15	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 17:15	MED
benzene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
toluene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
xylenes	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 17:15	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/01/98 17:15	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 17:15	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 17:15	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 17:15	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 17:15	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 004

SW-120 GRAB 04/27/98 @1145

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 17:15	MED
Surrogates				SW-846 8240	5/01/98 17:15	MED
Dibromofluoromethane	106		86-118%	SW-846 8240	5/01/98 17:15	MED
4-Bromofluorobenzene	107		86-115%	SW-846 8240	5/01/98 17:15	MED
Toluene-D8	97		88-110%	SW-846 8240	5/01/98 17:15	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 005

SAMPLE DESCRIPTION: P-36S GRAB 04/27/98 @1215

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	< 10	10	ug/l	SW-846 8240	5/01/98 18:15	MED
bromomethane	< 10	10	ug/l	SW-846 8240	5/01/98 18:15	MED
vinyl chloride	2	1	ug/l	SW-846 8240	5/01/98 18:15	MED
dichlorodifluoromethane	< 10	10	ug/l	SW-846 8240	5/01/98 18:15	MED
chloroethane	< 10	10	ug/l	SW-846 8240	5/01/98 18:15	MED
methylene chloride	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
trichlorofluoromethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,1-dichloroethylene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,1-dichloroethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
trans-1,2-dichloroethylene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
chloroform	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,2-dichloroethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,1,1-Trichloroethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
carbon tetrachloride	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
bromodichloromethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,2-dichloropropane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
cis-1,3-dichloropropylene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
trichloroethylene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
trans-1,3-dichloropropylene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,1,2-Trichloroethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
Dibromochloromethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
Bromoform	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
Tetrachloroethylene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,1,2,2-Tetrachloroethane	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
Chlorobenzene	260	1	ug/l	SW-846 8240	5/01/98 18:15	MED
2-chloroethyl vinyl ether	< 2	2	ug/l	SW-846 8240	5/01/98 18:15	MED
benzene	3	1	ug/l	SW-846 8240	5/01/98 18:15	MED
toluene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
ethylbenzene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
xylenes	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
acetone	< 10	10	ug/l	SW-846 8240	5/01/98 18:15	MED
carbon disulfide	< 5	5	ug/l	SW-846 8240	5/01/98 18:15	MED
2-butanone	< 10	10	ug/l	SW-846 8240	5/01/98 18:15	MED
vinyl acetate	< 50	50	ug/l	SW-846 8240	5/01/98 18:15	MED
4-methyl-2-pentanone	< 50	50	ug/l	SW-846 8240	5/01/98 18:15	MED
2-hexanone	< 50	50	ug/l	SW-846 8240	5/01/98 18:15	MED
Styrene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
O-chlorotoluene	< 1	1	ug/l	SW-846 8240	5/01/98 18:15	MED

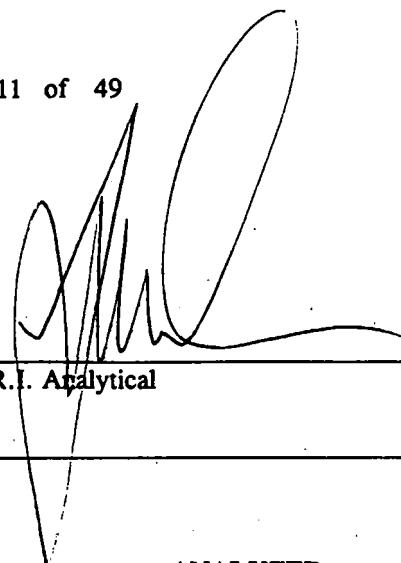
R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical



Sample #: 005

P-36S GRAB 04/27/98 @1215

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 18:15	MED
Surrogates				SW-846 8240	5/01/98 18:15	MED
Dibromofluoromethane	108		86-118%	SW-846 8240	5/01/98 18:15	MED
4-Bromofluorobenzene	110		86-115%	SW-846 8240	5/01/98 18:15	MED
Toluene-D8	107		88-110%	SW-846 8240	5/01/98 18:15	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 006

SAMPLE DESCRIPTION: P-34S GRAB 04/27/98 @1350

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 19:27	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 19:27	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 19:27	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 19:27	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
Chlorobenzene	420	1	ug/l	SW-846 8240	5/01/98 19:27	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 19:27	MED
benzene	9	1	ug/l	SW-846 8240	5/01/98 19:27	MED
toluene	110	1	ug/l	SW-846 8240	5/01/98 19:27	MED
ethylbenzene	3	1	ug/l	SW-846 8240	5/01/98 19:27	MED
xylenes	8	1	ug/l	SW-846 8240	5/04/98 22:56	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 19:27	MED
carbon disulfide	<5	.5	ug/l	SW-846 8240	5/01/98 19:27	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 19:27	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 19:27	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 19:27	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 19:27	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
O-chlorotoluene	130	1	ug/l	SW-846 8240	5/01/98 19:27	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 006

P-34S GRAB 04/27/98 @1350

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	2	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 19:27	MED
Surrogates				SW-846 8240	5/01/98 19:27	MED
Dibromofluoromethane	112		86-118%	SW-846 8240	5/01/98 19:27	MED
4-Bromofluorobenzene	110		86-115%	SW-846 8240	5/01/98 19:27	MED
Toluene-D8	101		88-110%	SW-846 8240	5/01/98 19:27	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order #: 9804-03198

Approved by:

R.I. Analytical

Sample #: 007

SAMPLE DESCRIPTION: MW-01S GRAB 04/27/98 @1555

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 20:35	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 20:35	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 20:35	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 20:35	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
Chlorobenzene	2800	1	ug/l	SW-846 8240	5/01/98 20:35	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 20:35	MED
benzene	3	1	ug/l	SW-846 8240	5/01/98 20:35	MED
toluene	1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
ethylbenzene	4	1	ug/l	SW-846 8240	5/01/98 20:35	MED
xylenes	2	1	ug/l	SW-846 8240	5/01/98 20:35	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 20:35	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/01/98 20:35	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 20:35	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 20:35	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 20:35	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 20:35	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 007

MW-01S GRAB 04/27/98 @1555

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 20:35	MED
Surrogates				SW-846 8240	5/01/98 20:35	MED
Dibromofluoromethane	107		86-118%	SW-846 8240	5/01/98 20:35	MED
4-Bromofluorobenzene	98		86-115%	SW-846 8240	5/01/98 20:35	MED
Toluene-D8	101		88-110%	SW-846 8240	5/01/98 20:35	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 008

SAMPLE DESCRIPTION: SW-130 GRAB 04/27/98 @1430

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 21:41	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 21:41	MED
vinyl chloride	2	1	ug/l	SW-846 8240	5/01/98 21:41	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 21:41	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 21:41	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
Chlorobenzene	27	1	ug/l	SW-846 8240	5/01/98 21:41	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 21:41	MED
benzene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
toluene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
xylanes	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 21:41	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/01/98 21:41	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 21:41	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 21:41	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 21:41	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 21:41	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
O-chlorotoluene	14	1	ug/l	SW-846 8240	5/01/98 21:41	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:
 R.I. Analytical

Sample #: 008

SW-130 GRAB 04/27/98 @1430

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 21:41	MED
Surrogates				SW-846 8240	5/01/98 21:41	MED
Dibromofluoromethane	112		86-118%	SW-846 8240	5/01/98 21:41	MED
4-Bromofluorobenzene	110		86-115%	SW-846 8240	5/01/98 21:41	MED
Toluene-D8	99		88-110%	SW-846 8240	5/01/98 21:41	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 009

SAMPLE DESCRIPTION: P-375 GRAB 04/27/98 @1530

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/01/98 22:51	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/01/98 22:51	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/01/98 22:51	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/01/98 22:51	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
chloroform	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
Chlorobenzene	420	1	ug/l	SW-846 8240	5/01/98 22:51	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/01/98 22:51	MED
benzene	9	1	ug/l	SW-846 8240	5/01/98 22:51	MED
toluene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
xylenes	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
acetone	<10	10	ug/l	SW-846 8240	5/01/98 22:51	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/01/98 22:51	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/01/98 22:51	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/01/98 22:51	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/01/98 22:51	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/01/98 22:51	MED
Styrene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
O-chlorotoluene	8	1	ug/l	SW-846 8240	5/01/98 22:51	MED



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:
R.I. Analytical

Sample #: 009

P-375 GRAB 04/27/98 @1530

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	2	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/01/98 22:51	MED
Surrogates				SW-846 8240	5/01/98 22:51	MED
Dibromofluoromethane	113		86-118%	SW-846 8240	5/01/98 22:51	MED
4-Bromofluorobenzene	110		86-115%	SW-846 8240	5/01/98 22:51	MED
Toluene-D8	110		88-110%	SW-846 8240	5/01/98 22:51	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

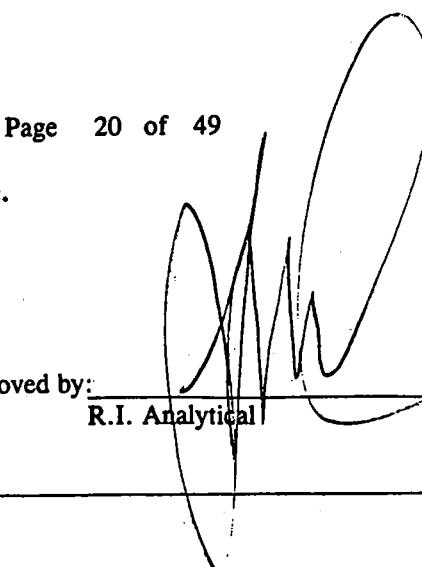
Approved by:

R.I. Analytical

Sample #: 010

SAMPLE DESCRIPTION: SW-110 GRAB 04/27/98 @1540

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/02/98 0:05	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/02/98 0:05	MED
vinyl chloride	2	1	ug/l	SW-846 8240	5/02/98 0:05	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/02/98 0:05	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/02/98 0:05	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,1-dichloroethylene	1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
chloroform	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
Chlorobenzene	1100	1	ug/l	SW-846 8240	5/02/98 0:05	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/02/98 0:05	MED
benzene	27	1	ug/l	SW-846 8240	5/02/98 0:05	MED
toluene	170	1	ug/l	SW-846 8240	5/02/98 0:05	MED
ethylbenzene	2	1	ug/l	SW-846 8240	5/02/98 0:05	MED
xylenes	6	1	ug/l	SW-846 8240	5/02/98 0:05	MED
acetone	<10	10	ug/l	SW-846 8240	5/02/98 0:05	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/02/98 0:05	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/02/98 0:05	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/02/98 0:05	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/02/98 0:05	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/02/98 0:05	MED
Styrene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
O-chlorotoluene	2	1	ug/l	SW-846 8240	5/02/98 0:05	MED



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 010

SW-110 GRAB 04/27/98 @1540

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	21	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 0:05	MED
Surrogates				SW-846 8240	5/02/98 0:05	MED
Dibromoform	110		86-118%	SW-846 8240	5/02/98 0:05	MED
4-Bromofluorobenzene	107		86-115%	SW-846 8240	5/02/98 0:05	MED
Toluene-D8	107		88-110%	SW-846 8240	5/02/98 0:05	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 013

SAMPLE DESCRIPTION: FIELD BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/02/98 1:23	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/02/98 1:23	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/02/98 1:23	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/02/98 1:23	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
chloroform	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
Chlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/02/98 1:23	MED
benzene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
toluene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
xylenes	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
acetone	<10	10	ug/l	SW-846 8240	5/02/98 1:23	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/02/98 1:23	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/02/98 1:23	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/02/98 1:23	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/02/98 1:23	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/02/98 1:23	MED
Styrene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 013

FIELD BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 1:23	MED
Surrogates				SW-846 8240	5/02/98 1:23	MED
Dibromofluoromethane	108		86-118%	SW-846 8240	5/02/98 1:23	MED
4-Bromofluorobenzene	110		86-115%	SW-846 8240	5/02/98 1:23	MED
Toluene-D8	107		88-110%	SW-846 8240	5/02/98 1:23	MED

Volatile organic analyses performed under the operating guidelines
of method 8260

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 014

SAMPLE DESCRIPTION: TRIP BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/02/98 2:47	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/02/98 2:47	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/02/98 2:47	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/02/98 2:47	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
chloroform	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
Chlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/02/98 2:47	MED
benzene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
toluene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
xylanes	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
acetone	<10	10	ug/l	SW-846 8240	5/02/98 2:47	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/02/98 2:47	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/02/98 2:47	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/02/98 2:47	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/02/98 2:47	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/02/98 2:47	MED
Styrene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 014

TRIP BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 2:47	MED
Surrogates				SW-846 8240	5/02/98 2:47	MED
Dibromofluoromethane	111		86-118%	SW-846 8240	5/02/98 2:47	MED
4-Bromofluorobenzene	98		86-115%	SW-846 8240	5/02/98 2:47	MED
Toluene-D8	108		88-110%	SW-846 8240	5/02/98 2:47	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 015

SAMPLE DESCRIPTION: P-38S GRAB 04/28/98 @0835

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/02/98 4:12	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/02/98 4:12	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/02/98 4:12	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/02/98 4:12	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
chloroform	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,2-dichloroproppane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
Chlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/02/98 4:12	MED
benzene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
toluene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
xylanes	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
acetone	<10	10	ug/l	SW-846 8240	5/02/98 4:12	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/02/98 4:12	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/02/98 4:12	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/02/98 4:12	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/02/98 4:12	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/02/98 4:12	MED
Styrene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:
 R.I. Analytical

Sample #: 015

P-38S GRAB 04/28/98 @0835

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 4:12	MED
Surrogates				SW-846 8240	5/02/98 4:12	MED
Dibromofluoromethane	117		86-118%	SW-846 8240	5/02/98 4:12	MED
4-Bromofluorobenzene	94		86-115%	SW-846 8240	5/02/98 4:12	MED
Toluene-D8	106		88-110%	SW-846 8240	5/02/98 4:12	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 016

SAMPLE DESCRIPTION: MW-13S GRAB 04/28/98 @0910

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/02/98 5:30	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/02/98 5:30	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/02/98 5:30	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/02/98 5:30	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
chloroform	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
Chlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/02/98 5:30	MED
benzene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
toluene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
xylenes	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
acetone	<10	10	ug/l	SW-846 8240	5/02/98 5:30	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/02/98 5:30	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/02/98 5:30	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/02/98 5:30	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/02/98 5:30	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/02/98 5:30	MED
Styrene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 016

MW-13S GRAB 04/28/98 @0910

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 5:30	MED
Surrogates				SW-846 8240	5/02/98 5:30	MED
Dibromofluoromethane	114		86-118%	SW-846 8240	5/02/98 5:30	MED
4-Bromofluorobenzene	109		86-115%	SW-846 8240	5/02/98 5:30	MED
Toluene-D8	111		88-110%	SW-846 8240	5/02/98 5:30	MED

Volatile organic analyses performed under the operating guidelines
method 8260.



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

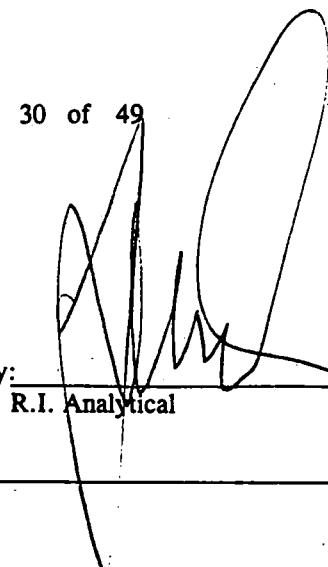
Approved by:

R.I. Analytical

Sample #: 017

SAMPLE DESCRIPTION: MW-12S GRAB 04/28/98 @0950

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	< 10	10	ug/l	SW-846 8240	5/02/98 6:45	MED
bromomethane	< 10	10	ug/l	SW-846 8240	5/02/98 6:45	MED
vinyl chloride	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
dichlorodifluoromethane	< 10	10	ug/l	SW-846 8240	5/02/98 6:45	MED
chloroethane	< 10	10	ug/l	SW-846 8240	5/02/98 6:45	MED
methylene chloride	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
trichlorofluoromethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,1-dichloroethylene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,1-dichloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
trans-1,2-dichloroethylene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
chloroform	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,2-dichloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,1,1-Trichloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
carbon tetrachloride	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
bromodichloromethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,2-dichloropropane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
cis-1,3-dichloropropylene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
trichloroethylene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
trans-1,3-dichloropropylene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,1,2-Trichloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
Dibromochloromethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
Bromoform	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
Tetrachloroethylene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,1,2,2-Tetrachloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
Chlorobenzene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
2-chloroethyl vinyl ether	< 2	2	ug/l	SW-846 8240	5/02/98 6:45	MED
benzene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
toluene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
ethylbenzene	26	1	ug/l	SW-846 8240	5/02/98 6:45	MED
xylenes	65	1	ug/l	SW-846 8240	5/02/98 6:45	MED
acetone	< 10	10	ug/l	SW-846 8240	5/02/98 6:45	MED
carbon disulfide	< 5	5	ug/l	SW-846 8240	5/02/98 6:45	MED
2-butanone	< 10	10	ug/l	SW-846 8240	5/02/98 6:45	MED
vinyl acetate	< 50	50	ug/l	SW-846 8240	5/02/98 6:45	MED
4-methyl-2-pentanone	< 50	50	ug/l	SW-846 8240	5/02/98 6:45	MED
2-hexanone	< 50	50	ug/l	SW-846 8240	5/02/98 6:45	MED
Styrene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
O-chlorotoluene	< 1	1	ug/l	SW-846 8240	5/02/98 6:45	MED



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:
 R.I. Analytical

Sample #: 017

MW-12S GRAB 04/28/98 @0950

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 6:45	MED
Surrogates				SW-846 8240	5/02/98 6:45	MED
Dibromofluoromethane	115		86-118%	SW-846 8240	5/02/98 6:45	MED
4-Bromofluorobenzene	118		86-115%	SW-846 8240	5/02/98 6:45	MED
Toluene-D8	100		88-110%	SW-846 8240	5/02/98 6:45	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

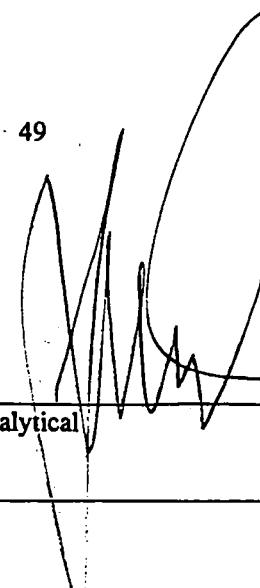
Approved by:

R.I. Analytical

Sample #: 018

SAMPLE DESCRIPTION: MW-04S GRAB 04/28/98 @1050

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	< 10	10	ug/l	SW-846 8240	5/02/98 8:00	MED
bromomethane	< 10	10	ug/l	SW-846 8240	5/02/98 8:00	MED
vinyl chloride	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
dichlorodifluoromethane	< 10	10	ug/l	SW-846 8240	5/02/98 8:00	MED
chloroethane	< 10	10	ug/l	SW-846 8240	5/02/98 8:00	MED
methylene chloride	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
trichlorofluoromethane	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,1-dichloroethylene	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,1-dichloroethane	1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
trans-1,2-dichloroethylene	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
chloroform	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,2-dichloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,1,1-Trichloroethane	2	1	ug/l	SW-846 8240	5/02/98 8:00	MED
carbon tetrachloride	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
bromodichloromethane	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,2-dichloropropane	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
cis-1,3-dichloropropylene	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
trichloroethylene	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
trans-1,3-dichloropropylene	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,1,2-Trichloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
Dibromochloromethane	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
Bromoform	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
Tetrachloroethylene	2	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,1,2,2-Tetrachloroethane	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
Chlorobenzene	220	1	ug/l	SW-846 8240	5/02/98 8:00	MED
2-chloroethyl vinyl ether	< 2	2	ug/l	SW-846 8240	5/02/98 8:00	MED
benzene	1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
toluene	2700	1	ug/l	SW-846 8240	5/02/98 8:00	MED
ethylbenzene	38	1	ug/l	SW-846 8240	5/02/98 8:00	MED
xylenes	130	1	ug/l	SW-846 8240	5/02/98 8:00	MED
acetone	< 10	10	ug/l	SW-846 8240	5/02/98 8:00	MED
carbon disulfide	< 5	5	ug/l	SW-846 8240	5/02/98 8:00	MED
2-butanone	< 10	10	ug/l	SW-846 8240	5/02/98 8:00	MED
vinyl acetate	< 50	50	ug/l	SW-846 8240	5/02/98 8:00	MED
4-methyl-2-pentanone	< 50	50	ug/l	SW-846 8240	5/02/98 8:00	MED
2-hexanone	< 50	50	ug/l	SW-846 8240	5/02/98 8:00	MED
Styrene	< 1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
O-chlorotoluene	1200	1	ug/l	SW-846 8240	5/02/98 8:00	MED



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 018

MW-04S GRAB 04/28/98 @1050

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	40	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 8:00	MED
Surrogates				SW-846 8240	5/02/98 8:00	MED
Dibromofluoromethane	111		86-118%	SW-846 8240	5/02/98 8:00	MED
4-Bromofluorobenzene	108		86-115%	SW-846 8240	5/02/98 8:00	MED
Toluene-D8	107		88-110%	SW-846 8240	5/02/98 8:00	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

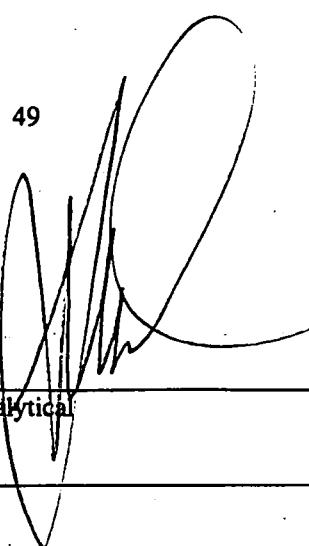
Approved by:

R.I. Analytical

Sample #: 019

SAMPLE DESCRIPTION: MW-04S DUPLICATE GRAB 04/28/98 @1050

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/02/98 9:16	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/02/98 9:16	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/02/98 9:16	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/02/98 9:16	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,1-dichloroethane	1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
chloroform	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,1,1-Trichloroethane	2	1	ug/l	SW-846 8240	5/02/98 9:16	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
Tetrachloroethylene	2	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
Chlorobenzene	190	1	ug/l	SW-846 8240	5/02/98 9:16	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/02/98 9:16	MED
benzene	1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
toluene	2600	1	ug/l	SW-846 8240	5/02/98 9:16	MED
ethylbenzene	43	1	ug/l	SW-846 8240	5/02/98 9:16	MED
xylenes	120	1	ug/l	SW-846 8240	5/02/98 9:16	MED
acetone	<10	10	ug/l	SW-846 8240	5/02/98 9:16	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/02/98 9:16	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/02/98 9:16	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/02/98 9:16	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/02/98 9:16	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/02/98 9:16	MED
Styrene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
O-chlorotoluene	950	1	ug/l	SW-846 8240	5/02/98 9:16	MED



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 019

MW-04S DUPLICATE GRAB 04/28/98 @1050

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	46	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/02/98 9:16	MED
Surrogates				SW-846 8240	5/02/98 9:16	MED
Dibromofluoromethane	111		86-118%	SW-846 8240	5/02/98 9:16	MED
4-Bromofluorobenzene	89		86-115%	SW-846 8240	5/02/98 9:16	MED
Toluene-D8	88		88-110%	SW-846 8240	5/02/98 9:16	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 020

SAMPLE DESCRIPTION: MW-14S (UE-11) GRAB 04/28/98 @1135

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<100	100	ug/l	SW-846 8240	5/05/98 1:22	MED
bromomethane	<100	100	ug/l	SW-846 8240	5/05/98 1:22	MED
vinyl chloride	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
dichlorodifluoromethane	<100	100	ug/l	SW-846 8240	5/05/98 1:22	MED
chloroethane	<100	100	ug/l	SW-846 8240	5/05/98 1:22	MED
methylene chloride	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
trichlorofluoromethane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,1-dichloroethylene	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,1-dichloroethane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
trans-1,2-dichloroethylene	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
chloroform	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,2-dichloroethane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,1,1-Trichloroethane	47	10	ug/l	SW-846 8240	5/05/98 1:22	MED
carbon tetrachloride	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
bromodichloromethane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,2-dichloropropane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
cis-1,3-dichloropropylene	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
trichloroethylene	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
trans-1,3-dichloropropylene	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,1,2-Trichloroethane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
Dibromochloromethane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
Bromoform	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
Tetrachloroethylene	180	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,1,2,2-Tetrachloroethane	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
Chlorobenzene	130	10	ug/l	SW-846 8240	5/05/98 1:22	MED
2-chloroethyl vinyl ether	<20	20	ug/l	SW-846 8240	5/05/98 1:22	MED
benzene	12	10	ug/l	SW-846 8240	5/05/98 1:22	MED
toluene	93000	10	ug/l	SW-846 8240	5/05/98 1:22	MED
ethylbenzene	2600	10	ug/l	SW-846 8240	5/05/98 1:22	MED
xylenes	14000	10	ug/l	SW-846 8240	5/05/98 1:22	MED
acetone	<100	100	ug/l	SW-846 8240	5/05/98 1:22	MED
carbon disulfide	<50	50	ug/l	SW-846 8240	5/05/98 1:22	MED
2-butanone	<100	100	ug/l	SW-846 8240	5/05/98 1:22	MED
vinyl acetate	<500	500	ug/l	SW-846 8240	5/05/98 1:22	MED
4-methyl-2-pentanone	<500	500	ug/l	SW-846 8240	5/05/98 1:22	MED
2-hexanone	<500	500	ug/l	SW-846 8240	5/05/98 1:22	MED
Styrene	<10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
O-chlorotoluene	60000	10	ug/l	SW-846 8240	5/05/98 1:22	MED

R.I. Analytical Laboratories, Inc.**CERTIFICATE OF ANALYSIS**

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 020

MW-14S (UE-11) GRAB 04/28/98 @1135

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	180	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,3-Dichlorobenzene	< 10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
1,4-Dichlorobenzene	< 10	10	ug/l	SW-846 8240	5/05/98 1:22	MED
Surrogates				SW-846 8240	5/05/98 1:22	MED
Dibromofluoromethane	111		86-118%	SW-846 8240	5/05/98 1:22	MED
4-Bromofluorobenzene	110		86-115%	SW-846 8240	5/05/98 1:22	MED
Toluene-D8	102		88-110%	SW-846 8240	5/05/98 1:22	MED

Volatile organic analyses performed under the operating guidelines
method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 021

SAMPLE DESCRIPTION: MW-21S GRAB 04/28/98 @1315

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/04/98 23:43	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/04/98 23:43	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/04/98 23:43	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/04/98 23:43	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
chloroform	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
Chlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/04/98 23:43	MED
benzene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
toluene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
xylenes	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
acetone	<10	10	ug/l	SW-846 8240	5/04/98 23:43	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/04/98 23:43	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/04/98 23:43	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/04/98 23:43	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/04/98 23:43	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/04/98 23:43	MED
Styrene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
O-chlorotoluene	54	1	ug/l	SW-846 8240	5/04/98 23:43	MED

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

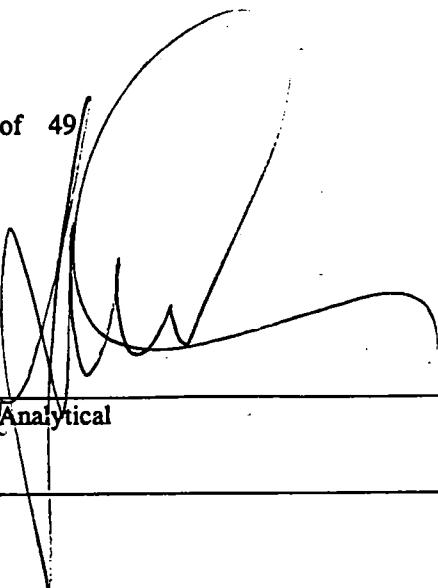
R.I. Analytical

Sample #: 021

MW-21S GRAB 04/28/98 @1315

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 23:43	MED
Surrogates				SW-846 8240	5/04/98 23:43	MED
Dibromofluoromethane	108		86-118%	SW-846 8240	5/04/98 23:43	MED
4-Bromofluorobenzene	109		86-115%	SW-846 8240	5/04/98 23:43	MED
Toluene-D8	95		88-110%	SW-846 8240	5/04/98 23:43	MED

Volatile organic analyses performed under the operating guidelines
method 8260.



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

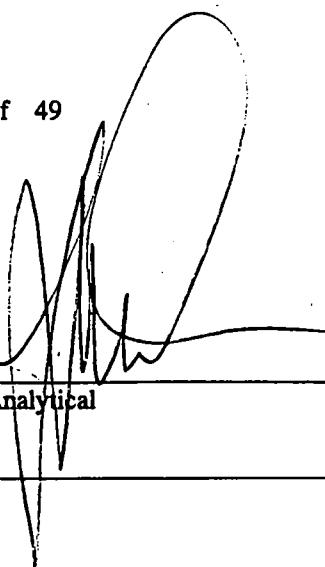
Approved by:

R.I. Analytical

Sample #: 024

SAMPLE DESCRIPTION: FIELD BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/05/98 0:33	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/05/98 0:33	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/05/98 0:33	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/05/98 0:33	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
chloroform	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
Chlorobenzene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/05/98 0:33	MED
benzene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
toluene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
xylenes	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
acetone	<10	10	ug/l	SW-846 8240	5/05/98 0:33	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/05/98 0:33	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/05/98 0:33	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/05/98 0:33	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/05/98 0:33	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/05/98 0:33	MED
Styrene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 024

FIELD BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/05/98 0:33	MED
Surrogates				SW-846 8240	5/05/98 0:33	MED
Dibromofluoromethane	111		86-118%	SW-846 8240	5/05/98 0:33	MED
4-Bromofluorobenzene	109		86-115%	SW-846 8240	5/05/98 0:33	MED
Toluene-D8	107		88-110%	SW-846 8240	5/05/98 0:33	MED

Volatile organic analyses performed under the operating guidelines
 method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 025

SAMPLE DESCRIPTION: TRIP BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
chloromethane	<10	10	ug/l	SW-846 8240	5/04/98 22:56	MED
bromomethane	<10	10	ug/l	SW-846 8240	5/04/98 22:56	MED
vinyl chloride	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
dichlorodifluoromethane	<10	10	ug/l	SW-846 8240	5/04/98 22:56	MED
chloroethane	<10	10	ug/l	SW-846 8240	5/04/98 22:56	MED
methylene chloride	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
trichlorofluoromethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,1-dichloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,1-dichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
trans-1,2-dichloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
chloroform	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,2-dichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
carbon tetrachloride	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
bromodichloromethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,2-dichloropropane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
cis-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
trichloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
trans-1,3-dichloropropylene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
Dibromochloromethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
Bromoform	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
Tetrachloroethylene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
Chlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
2-chloroethyl vinyl ether	<2	2	ug/l	SW-846 8240	5/04/98 22:56	MED
benzene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
toluene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
ethylbenzene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
xylenes	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
acetone	<10	10	ug/l	SW-846 8240	5/04/98 22:56	MED
carbon disulfide	<5	5	ug/l	SW-846 8240	5/04/98 22:56	MED
2-butanone	<10	10	ug/l	SW-846 8240	5/04/98 22:56	MED
vinyl acetate	<50	50	ug/l	SW-846 8240	5/04/98 22:56	MED
4-methyl-2-pentanone	<50	50	ug/l	SW-846 8240	5/04/98 22:56	MED
2-hexanone	<50	50	ug/l	SW-846 8240	5/04/98 22:56	MED
Styrene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
O-chlorotoluene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED



R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 025

TRIP BLANK

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8240	5/04/98 22:56	MED
Surrogates				SW-846 8240	5/04/98 22:56	MED
Dibromofluoromethane	108		86-118%	SW-846 8240	5/04/98 22:56	MED
4-Bromofluorobenzene	108		86-115%	SW-846 8240	5/04/98 22:56	MED
Toluene-D8	108		88-110%	SW-846 8240	5/04/98 22:56	MED

Method 8240: Volatile organic analyses performed under the
operating guidelines of method 8260.

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by: _____
 R.I. Analytical

Sample #: 001

SAMPLE DESCRIPTION: MW-02S GRAB 04/27/98 @0955

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.2		SU	EPA 150.1	4/27/98 9:55	GFH
TEMPERATURE (field)	55		F	EPA 170.1	4/27/98 9:55	GFH
SPECIFIC CONDUCTANCE	47		µMHOS/CM	EPA 120.1	4/27/98 9:55	GFH
Dissolved Oxygen	2.1		mg/l	EPA 360.1	4/27/98 9:55	GFH

Depth to Water = 6.4'

Sample #: 002

SAMPLE DESCRIPTION: P-02D GRAB 04/27/98 @1045

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.1		SU	EPA 150.1	4/27/98 10:45	GFH
TEMPERATURE (field)	62		F	EPA 170.1	4/27/98 10:45	GFH
SPECIFIC CONDUCTANCE	47		µMHOS/CM	EPA 120.1	4/27/98 10:45	GFH
Dissolved Oxygen	4.1		mg/l	EPA 360.1	4/27/98 10:45	GFH

Depth to Water = 6.4'

Sample #: 003

SAMPLE DESCRIPTION: P-35S GRAB 04/27/98 @1110

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	7.7		SU	EPA 150.1	4/27/98 11:10	GFH
TEMPERATURE (field)	58		F	EPA 170.1	4/27/98 11:10	GFH
SPECIFIC CONDUCTANCE	76		µMHOS/CM	EPA 120.1	4/27/98 11:10	GFH
Dissolved Oxygen	0.0		mg/l	EPA 360.1	4/27/98 11:10	GFH

Depth to Water = 6.8'

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by: _____
 R.I. Analytical

Sample #: 004

SAMPLE DESCRIPTION: SW-120 GRAB 04/27/98 @1145

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	9.4		SU	EPA 150.1	4/27/98 11:45	GFH
TEMPERATURE (field)	58		F	EPA 170.1	4/27/98 11:45	GFH
SPECIFIC CONDUCTANCE	410		uMHOS/CM	EPA 120.1	4/27/98 11:45	GFH
Dissolved Oxygen	0.8		mg/l	EPA 360.1	4/27/98 11:45	GFH

Depth to Water = 7.7'

Sample #: 005

SAMPLE DESCRIPTION: P-36S GRAB 04/27/98 @1215

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.5		SU	EPA 150.1	4/27/98 12:15	GFH
TEMPERATURE (field)	54		F	EPA 170.1	4/27/98 12:15	GFH
SPECIFIC CONDUCTANCE	50		uMHOS/CM	EPA 120.1	4/27/98 12:15	GFH
Dissolved Oxygen	0.0		mg/l	EPA 360.1	4/27/98 12:15	GFH

Depth to Water = 7.4'

Sample #: 006

SAMPLE DESCRIPTION: P-34S GRAB 04/27/98 @1350

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.5		SU	EPA 150.1	4/27/98 13:50	GFH
TEMPERATURE (field)	52		F	EPA 170.1	4/27/98 12:15	GFH
SPECIFIC CONDUCTANCE	487		uMHOS/CM	EPA 120.1	4/27/98 13:50	GFH
Dissolved Oxygen	6.7		mg/l	EPA 360.1	4/27/98 13:50	GFH

Depth to Water = 6'

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.

Date Received: 4/28/98

Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 007

SAMPLE DESCRIPTION: MW-01S GRAB 04/27/98 @1555

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.0		SU	EPA 150.1	4/27/98 15:55	GFH
TEMPERATURE (field)	53		F	EPA 170.1	4/27/98 15:55	GFH
SPECIFIC CONDUCTANCE	82		uMHOS/CM	EPA 120.1	4/27/98 15:55	GFH
Dissolved Oxygen	2.1		mg/l	EPA 360.1	4/27/98 15:55	GFH

Depth to Water 7.3'

Sample #: 008

SAMPLE DESCRIPTION: SW-130 GRAB 04/27/98 @1430

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.7		SU	EPA 150.1	4/27/98 14:30	GFH
TEMPERATURE (field)	57		F	EPA 170.1	4/27/98 14:30	GFH
SPECIFIC CONDUCTANCE	415		uMHOS/CM	EPA 120.1	4/27/98 14:30	GFH
Dissolved Oxygen	2.1		mg/l	EPA 360.1	4/27/98 14:30	GFH

Depth to Water = 9.6'

Sample #: 009

SAMPLE DESCRIPTION: P-375 GRAB 04/27/98 @1530

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.8		SU	EPA 150.1	4/27/98 15:30	GFH
TEMPERATURE (field)	54		F	EPA 170.1	4/27/98 15:30	GFH
SPECIFIC CONDUCTANCE	69		uMHOS/CM	EPA 120.1	4/27/98 15:30	GFH
Dissolved Oxygen	1.4		mg/l	EPA 360.1	4/27/98 15:30	GFH

Depth to Water - 10.3'

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by: _____
 R.I. Analytical

Sample #: 010

SAMPLE DESCRIPTION: SW-110 GRAB 04/27/98 @1540

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	8.3		SU	EPA 150.1	4/27/98 15:40	GFH
TEMPERATURE (field)	52		F	EPA 170.1	4/27/98 15:40	GFH
SPECIFIC CONDUCTANCE	30		uMHOS/CM	EPA 120.1	4/27/98 15:40	GFH
Dissolved Oxygen	NA		mg/l	EPA 360.1	4/27/98 15:40	GFH

Depth to Water - 9.4'

Sample #: 015

SAMPLE DESCRIPTION: P-38S GRAB 04/28/98 @0835

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	9.0		SU	EPA 150.1	4/28/98 8:35	GFH
TEMPERATURE (field)	55		F	EPA 170.1	4/28/98 8:35	GFH
SPECIFIC CONDUCTANCE	36		uMHOS/CM	EPA 120.1	4/28/98 8:35	GFH
Dissolved Oxygen	1.0		mg/l	EPA 360.1	4/28/98 8:35	GFH

Depth of Water 6.8'

Sample #: 016

SAMPLE DESCRIPTION: MW-13S GRAB 04/28/98 @0910

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	7.9		SU	EPA 150.1	4/28/98 9:10	GFH
TEMPERATURE (field)	55		F	EPA 170.1	4/28/98 9:10	GFH
SPECIFIC CONDUCTANCE	43		uMHOS/CM	EPA 120.1	4/28/98 9:10	GFH
Dissolved Oxygen	1.5		mg/l	EPA 360.1	4/28/98 9:10	GFH

Depth of Water 8.6'

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by: _____
 R.I. Analytical

Sample #: 017

SAMPLE DESCRIPTION: MW-12S GRAB 04/28/98 @0950

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	7.4		SU	EPA 150.1	4/28/98 9:50	GFH
TEMPERATURE (field)	63		F	EPA 170.1	4/28/98 9:50	GFH
SPECIFIC CONDUCTANCE	39		µMHOS/CM	EPA 120.1	4/28/98 9:50	GFH
Dissolved Oxygen	1.1		mg/l	EPA 360.1	4/28/98 9:50	GFH

Depth to Water 11.3'

Sample #: 018

SAMPLE DESCRIPTION: MW-04S GRAB 04/28/98 @1050

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	7.4		SU	EPA 150.1	4/28/98 10:50	GFH
TEMPERATURE (field)	63		F	EPA 170.1	4/28/98 10:50	GFH
SPECIFIC CONDUCTANCE	57		µMHOS/CM	EPA 120.1	4/28/98 10:50	GFH
Dissolved Oxygen	4.8		mg/l	EPA 360.1	4/28/98 10:50	GFH

Depth to Water - 10.4'

Sample #: 020

SAMPLE DESCRIPTION: MW-14S (UE-11) GRAB 04/28/98 @1135

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	NA		SU	EPA 150.1	4/28/98 11:35	GFH
TEMPERATURE (field)	NA		F	EPA 170.1	4/28/98 11:35	GFH
SPECIFIC CONDUCTANCE	NA		µMHOS/CM	EPA 120.1	4/28/98 11:35	GFH
Dissolved Oxygen	NA		mg/l	EPA 360.1	4/28/98 11:35	GFH

Depth to Water = *

* Product layer prevents use of equipment

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

Ciba Specialty Chemicals Corp.
 Date Received: 4/28/98
 Work Order # 9804-03198

Approved by:

R.I. Analytical

Sample #: 021

SAMPLE DESCRIPTION: MW-21S GRAB 04/28/98 @1315

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
pH (field)	7.8		SU	EPA 150.1	4/28/98 13:15	GFH
TEMPERATURE (field)	55		F	EPA 170.1	4/28/98 13:15	GFH
SPECIFIC CONDUCTANCE	36		µMHOS/CM	EPA 120.1	4/28/98 13:15	GFH
Dissolved Oxygen	1.0		mg/l	EPA 360.1	4/28/98 13:15	GFH

Depth to Water = 4'

QUALITY CONTROL

Ciba Specialities Corp.
 May 13, 1998
 Work order # 9804-03198

Method 8260
 PW-36S

- MATRIX SPIKE RESULTS -

PARAMETER	UNITS	SAMPLE #	SAMPLE CONC.	SPIKE CONC.	DETECTED CONC.	% RECOVERY	DATE ANALYZED
1,1-Dichloroethene	µg/l	3198-005	<1	12	12	100	05/04/98
Benzene	µg/l	3198-005	3	12	15	100	05/04/98
Trichloroethene	µg/l	3198-005	<1	12	11	92	05/04/98
Toluene	µg/l	3198-005	<1	12	11	92	05/04/98
Chlorobenzene	µ/g/l	3198-005	*	*	*	*	05/04/98

- MATRIX SPIKE DUPLICATE RESULTS -

PARAMETER	UNITS	SAMPLE #	SAMPLE CONC.	SPIKE CONC.	DETECTED CONC.	% RECOVERY	DATE ANALYZED
1,1-Dichloroethene	µg/l	03198-005	<1	12	11	92	05/04/98
Benzene	µg/l	03198-005	3	12	16	108	05/04/98
Trichloroethene	µg/l	03198-005	<1	12	12	100	05/04/98
Toluene	µg/l	03198-005	<1	12	15	125	05/04/98
Chlorobenzene	µg/l	03198-005	*	*	*	*	05/04/98

* Sample analyzed undiluted - results were above the calibration curve.

RI ANALYTICAL LABORATORIES, INC.

QUALITY CONTROL

Ciba Specialities Corp.
 May 13, 1998
 Work order # 9804-03198

Method 8260
 MW-21S

- MATRIX SPIKE RESULTS -

PARAMETER	UNITS	SAMPLE #	SAMPLE CONC.	SPIKE CONC.	DETECTED CONC.	% RECOVERY	DATE ANALYZED
1,1-Dichloroethene	µg/l	3198-021	<1	12	14	117	05/05/98
Benzene	µg/l	3198-021	<1	12	13	108	05/05/98
Trichloroethene	µg/l	3198-021	<1	12	12	100	05/05/98
Toluene	µg/l	3198-021	<1	12	14	117	05/05/98
Chlorobenzene	µg/l	3198-021	<1	12	12	100	05/05/98

- MATRIX SPIKE DUPLICATE RESULTS -

PARAMETER	UNITS	SAMPLE #	SAMPLE CONC.	SPIKE CONC.	DETECTED CONC.	% RECOVERY	DATE ANALYZED
1,1-Dichloroethene	µg/l	03198-021	<1	12	15	125	05/05/98
Benzene	µg/l	03198-021	<1	12	13	108	05/05/98
Trichloroethene	µg/l	03198-021	<1	12	12	100	05/05/98
Toluene	µg/l	03198-021	<1	12	13	108	05/05/98
Chlorobenzene	µg/l	03198-021	<1	12	14	117	05/05/98

RI ANALYTICAL LABORATORIES, INC.

R. I. ANALYTICAL LABORATORIES, INC.

41 Illinois Avenue · Warwick, Rhode Island 02888
(401) 737-8500 Fax (401) 738-1970

Company Name: CIBA	P.O. #
------------------------------	--------

Address:

City / State / Zip:

Phone / Fax:

Contact:

Barry Cohen

Relinquished by:

Date / Time
4/28/98 1455

Received by:
J. Wicker

Relinquished by:

Date / Time

Received by:

Belpointe

Date / Time

Received by

Total Numbers of Cont.

RIAL: 3198

9 – Pick-Up Only

- Sampled _____ Hours

 Shipped on Ice

Comments:

C.O.C 2 of 2

R. I. ANALYTICAL LABORATORIES, INC.

41 Illinois Avenue · Warwick, Rhode Island 02888
(401) 737-8500 Fax (401) 738-1970

Date Collected	Time Collected	Sample ID	Sample Type	5240 w/ 0-chloro dichloro differences	pH, temp	specific D.O.	Remarks	Total # of Cont.
4/27/88	0955	MW-025	Gra.B	X		X X X	HCL, cooled 40C	3
	1045	P-02D		X		X X X	.	3
	1110	P-355		X		X X X		3
	1145	SW-120		X		X X X		3
	1215	P-365		X		X X X		6
	1350	P-345		X		X X X		3
	1555	MW-015		X		X X X		3
	1430	SW-130		X		X X X		3
	1530	P-375		X		X X X		3
	1540	SW-110		X		X X X	↓	3
↓	1200	Field Blank		X				1
↓	0700	Trip Blank		X				1

Company Name: CiBA	P.O. #
------------------------------	--------

Address:

City / State / Zip:

Phone / Fax

FAX: 732-914-2909

Contact:

Barry Cohen

Relinquished by: Date / Time Received by:
G. Hause 4/28/98 1455 J. H. Clark
Relinquished by: Date / Time Received by:

Relinquished by: _____ **Date / Time** _____ **Received by:** _____

Relinquished by: _____ **Date / Time** _____ **Received by:** _____

Collected by: G. Harrison / P. Perrotti

Turn Around Time: Normal
 Rush

Comments:

Samples collected from Ciba Facility at Mill St. Cranston, R.I.

* QC to include; Matrix Spike

Matrix Spine { samples
Matrix Spite Duplicate } PW-36
 MW-21

C.O.C
1 of 2

* pH, temp., specific conductance, D.O. were field Analyzed. Results Attached

Appendix B



August 21, 1997

Mr. Barry Cohen
Ciba Specialty Chemicals, Inc.
P.O. Box 70
Toms River, NJ 08754

RE: Pawtuxet River Media Protection Standard for Xylenes in Groundwater

Dear Barry:

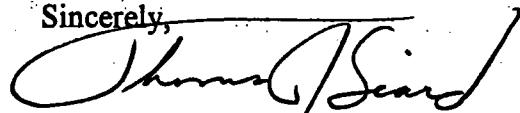
In response to your request last week, we have reviewed the media protection standard (MPS) for xylenes in groundwater and determined that it should be changed from 38 µg/l to 76 µg/l. This level is based on protection of invertebrates in river sediments, making the conservative assumption that groundwater concentrations equal sediment pore water concentrations.

Briefly, MPS values are derived from three types of studies. Ideally, chronic toxicity studies are used. This is because an MPS is designed to be protective of ecological receptors exposed throughout their entire lives at this concentration. The second choice of study duration would be a subchronic study. If appropriate chronic or subchronic studies are not available, acute toxicity studies are a third choice used to derive MPS values. According to the conversion method for acute-to-chronic exposure approved by USEPA Region I described in the Aquatic Baseline Ecological Risk Assessment for the Cranston Site, the results of an appropriate acute effective concentration (EC_{50}) study are divided by a factor of 50 to estimate a chronic protective concentration to be used as an MPS. Similarly, the results of an appropriate acute lethal concentration (LC_{50}) study are divided by 100 to derive the MPS.

To revise the MPS for xylenes we first searched current data bases to make sure that chronic or subchronic studies, which would be preferable, were not available for xylenes; there were none. We then examined data bases of acute studies for potential use in deriving MPS values for xylenes, including the literature source used for the original MPS. The revised MPS is based on the same study as the original MPS. This was an acute study using *Daphnia magna*. Acute studies using these short-lived organisms are approximately 24 hours duration and chronic studies are about 7 days. In reviewing the original literature source, we discovered that this (acute) study was based on an EC_{50} of 3.8 mg/l (3,800 µg/l) and not an LC_{50} as the authors indicated in a summary table in their paper. Therefore, we have revised the MPS value to 76 µg/l. We also verified that the EC_{50} study resulting in a value of 3.8 mg/l was comparable to xylene toxicity values obtained from other acute studies.

Barry, if you have questions or need additional information please call me or Rich McLean.

Sincerely,



Thomas J. Siard, M.S.
Risk Assessor/Toxicologist

cc:

R.B. McLean